Kentucky Academic Standards for Mathematics: Conceptual Category Number and Quantity

Number and Quantity Overview

The Real Number System	Quantities	The Complex Number System	Vector and Matrix Quantities
• Extend the properties of exponents to rational exponents. • Use properties of rational and irrational numbers.	• Reason quantitatively and use units to solve problems.	• Perform arithmetic operations with complex numbers. • Represent complex numbers and their operations on the complex plane. • Use complex numbers in polynomial identities and equations.	• Represent and model with vector quantities. • Perform operations on vectors. • Perform operations on matrices and use matrices in applications.

Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

Plus (+) Standards: Additional mathematics concepts students should learn in order to take advanced courses such as calculus, advanced statistics or discrete mathematics are indicated by (+) symbol.

Kentucky Academic Standards for Mathematics: Conceptual Category Algebra

Algebra Overview

Seeing Structure in Expressions	Arithmetic with Polynomials and Rational Expressions	Creating Equations ★	Reasoning with Equations and Inequalities
• Interpret the structure of expressions. • Write expressions in equivalent forms to solve problems.	• Perform arithmetic operations on polynomials. • Understand the relationship between zeros and factors of polynomials. • Use polynomial identities to solve problems. • Rewrite rational expressions.	• Create equations that describe numbers or relationships.	• Understand solving equations as a process of reasoning and explain the reasoning. • Solve equations and inequalities in one variable. • Solve systems of equations. • Represent and solve equations and inequalities graphically.

Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

Plus (+) Standards: Additional mathematics concepts students should learn in order to take advanced courses such as calculus, advanced statistics or discrete mathematics are indicated by (+) symbol.

Kentucky Academic Standards for Mathematics: Conceptual Category Functions

Functions Overview

Interpreting Functions	Building Functions	Linear, Quadratic and Exponential Models	Trigonometric Functions
• Understand the concept of a function and use function notation. • Interpret functions that arise in applications in terms of the context. • Analyze functions using different representations.	• Build a function that models a relationship between two quantities. • Build new functions from existing functions.	• Construct and compare linear, quadratic and exponential models and solve problems. • Interpret expressions for functions in terms of the situation they model.	• Extend the domain of trigonometric functions using the unit circle. • Model periodic phenomena with trigonometric functions. • Prove and apply trigonometric identities.

Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

Plus (+) Standards: Additional mathematics concepts students should learn in order to take advanced courses such as calculus, advanced statistics or discrete mathematics are indicated by (+) symbol.

Kentucky Academic Standards for Mathematics: Conceptual Category Geometry

Geometry Overview

Congruence	Similarity, Right Triangles and Trigonometry	Circles	Expressing Geometric Properties with Equations	Geometric Measurement and Dimensions	Modeling with Geometry
• Experiment with transformations in the plane. • Understand congruence in terms of rigid motions. • Prove geometric theorems. • Make geometric constructions.	• Understand similarity in terms of similarity transformations. • Prove theorems involving similarity. • Define trigonometric ratios and solve problems involving right triangles. • Apply trigonometry to general triangles.	• Understand and apply theorems about circles. • Find arc lengths and areas of sectors of circles.	• Translate between the geometric description and the equation for a conic section. • Use coordinates to prove simple geometric theorems algebraically.	• Explain volume formulas and use them to solve problems. • Visualize relationships between two-dimensional and three-dimensional objects	• Apply geometric concepts in modeling situations.

Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

Plus (+) Standards: Additional mathematics concepts students should learn in order to take advanced courses such as calculus, advanced statistics or discrete mathematics are indicated by (+) symbol.

Kentucky Academic Standards for Mathematics: Conceptual Category Statistics and Probability

Statistics and Probability Overview

Interpreting Categorical and Quantitative Data	Making Inferences and Justifying Conclusions	Conditional Probability and the Rules of Probability	Using Probability to Make Decisions
• Summarize, represent and interpret data on a single count or measurement variable. • Summarize, represent and interpret data on two categorical and quantitative variables. • Interpret linear models.	• Understand and evaluate random processes underlying statistical experiments. • Make inferences and justify conclusions from sample surveys, experiments and observational studies.	• Understand independence and conditional probability and use them to interpret data. • Use the rules of probability to compute probabilities of compound events in a uniform probability model.	• Calculate expected values and use them to solve problems. • Use probability to evaluate outcomes of decisions.

Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

Plus (+) Standards: Additional mathematics concepts students should learn in order to take advanced courses such as calculus, advanced statistics or discrete mathematics are indicated by (+) symbol.